Dynamo-electric machine ferrite core rotors

Publication number:	GB1009827
Publication date:	1965-11-10
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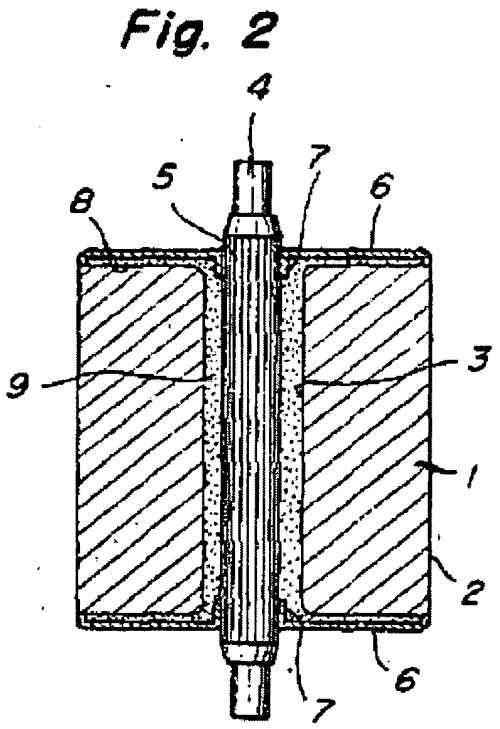
Classification:	
- international:	***H02K1/27;*** **H02K1/27;**
- european:	H02K1/27B2B2
Application number:	GB19630039798 19631009
Priority number(s):	GB19630039798 19631009

Abstract of **GB1009827**

1,009,827. Rotor core constructions. SANYO ELECTRIC CO. Ltd. Oct. 9, 1963, No. 39798/63. Heading H2A. A dynamo-electric machine rotor constructed to withstand centrifugal force comprises a shaft 4 extending through an axial bore 3 in a cylindrical ferrite core 1 which is permanently magnetized about its periphery 2 in alternately opposite polarities, and two centrally apertured retainer discs 6 fitted over the shaft in face-toface relationship with the adjacent core end faces, the components being joined together to form an integral assembly by a single continuous adhesive layer 9 which extends between opposed faces of the core, shaft and discs. The discs may be non-magnetic and have a central boss which is forced over a knurled portion 5 of the shaft, and the layer 9 may be an epoxy resin.



1,009,827

PATENT SPECIFICATION

DRAWINGS ATTACHED

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1,009,827

Date of Application and filing Complete Specification Oct. 9, 1963.

No. 39798/63.

Complete Specification Published Nov. 10, 1965.

Index at acceptance:—H2 A16X

Int. Cl.:—H 02 k

COMPLETE SPECIFICATION

Dynamo-electric Machine Ferrite Core Rotors

We, SANYO ELECTRIC COMPANY LIMITED, of 18 Keihan-Hondori-2-chome, Moriguchi-shi, Japan, a body corporate organized according to the laws of Japan, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to dynamo-electric machine rotors of the type employing a magnetic core of ferrite.

As compared with conventional rotor cores, ferrite cores have various advantages. For example, they exhibit exceedingly high coercive force, are magnetically highly stable even under the effect of external fields, and are less susceptible to the demagnetizing effect of mechanical shocks. On the other hands, ferrite cores are fragile compared with cores of any other core material.

It follows that, where ferrite cores are utilized as a rotor of a generator or other rotary machine, there is a danger that a crack take place in an axial direction under the centrifugal effect when the rotor is driven at high speed, thus making it impossible to withstand a mechanical destructive force in fully carrying out the purpose. The present invention is intended to overcome this difficulty and provides an improved dynamo-electric machine ferrite core rotor which comprises a rotor body formed by a cylindrical ferrite core permanently magnetized about the periphery thereof alternately in opposite polarities and having an axial bore extending therethrough, a rotor shaft extending through said axial bore in said rotor body, and a pair of retainer discs each having a central aperture and fitted over said rotor shaft in face-to-face relation with the adjacent end face of said rotor body, said rotor components being joined together by single continuous adhesive layer extending between the opposite end faces of said rotor body and said respective retainer discs as well as between said rotor body and said rotor shaft, to form an integral rotor assembly.

The foregoing and other objects, features and advantages of this invention will be apparent from the following description when taken in conjunction with the accompanying drawing, in which:

Fig. 1 is an exploded perspective view of a rotor embodying the present invention; and

Fig. 2 is a vertical elevation, partly in section, of the rotor assembly.

Referring to the drawing, the rotor embodying the invention includes a rotor body 1, a rotor shaft 4 and a pair of retainer discs 6. The rotor body 1 takes the form of a cylindrical ferrite core which has an axial bore 3 extending therethrough. The ferrite core 1 is permanently magnetized to form magnetic poles circumferentially arranged along the outer periphery 2 thereof alternately in opposite polarities. The rotor shaft 4 is fitted in the axial bore 3 in rotor body 1 and has an enlarged intermediate portion knurled to form axial ridges 5. The retainer discs 6 each have a central boss 7 forcibly fitted over the knurled portion of the rotor shaft 4 and thus held on the latter in closely spaced face-to-face relation to the adjacent end face 8 of the rotor body 1. The retainer discs 6 are desirably formed of nonmagnetic material in consideration of the leakage of the magnetic flux from the polarized surface 2 of the rotor body 1. In other words, if the retainer discs were formed of magnetic material, part of the magnetic flux passing from one magnetic pole to another would leak through the retainer discs

and the magnetic effect of the rotor would be reduced to that extent.

Reference numeral 9 indicates a continuous layer of an adhesive preferably of epoxy resin such as available under the name of "Araldite" (Registered Trade Mark). In assembling the rotor, the adhesive in liquid state is injected continuously into the space between the rotor shaft 4 and the inner wall of the axial bore 3 of the rotor body in which said shaft is fitted and between each of the retainer discs 6 and the adjacent end face 8 of the body 1 so that the component members are joined together into an integral assembly by a continuous adhesive layer 9.

Because of this integral structure, the rotor has an exceptionally large toughness enough to withstand any stress occurring in the rotor to act in a direction parallel or normal to the axis of the rotor in operation. It has been found that the binding strength of the rotor of this invention is much higher than that of conventional rotors in which the retainers and the rotor body are joined to each other and to the rotor shaft with separate adhesive layers, and is enough to prevent the rotor from being damaged by any mechanical shock. It is to be understood that the forced fitting of the retainer discs over the rotor shaft not only aids in joining the discs to the rotor shaft but is also effective to hold the discs in place on the shaft 4 relative to the respective end faces of the rotor body before the adhesive layer has completely solidified.

WHAT IS CLAIMED IS:—

1. A dynamo-electric machine ferrite core rotor comprising a rotor body formed by a cylindrical ferrite core permanently magnetized about the periphery thereof alternately in opposite polarities and having an axial bore extending therethrough, a rotor shaft extending through said axial bore in said rotor body, and a pair of retainer discs each having a central aperture and fitted over said rotor shaft in face-to-face relation with the adjacent end face of said rotor body, said rotor components being joined together by a single continuous adhesive layer extending between the opposite end faces of said rotor body and said respective retainer discs as well as between said rotor body and said rotor shaft, to form an integral rotor assembly.

2. A dynamo-electric machine ferrite core rotor constructed substantially as herein described with reference to and as illustrated in the accompanying drawing.

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Leamington Spa: Printed for Her Majesty's Stationery Office by the Courier Press.—1965.
Published at The Patent Office, 25, Southampton Buildings, London, W.C.2, from which copies may be obtained.

1009827 COMPLETE SPECIFICATION
1 SHEET *This drawing is a reproduction of the Original on a reduced scale*

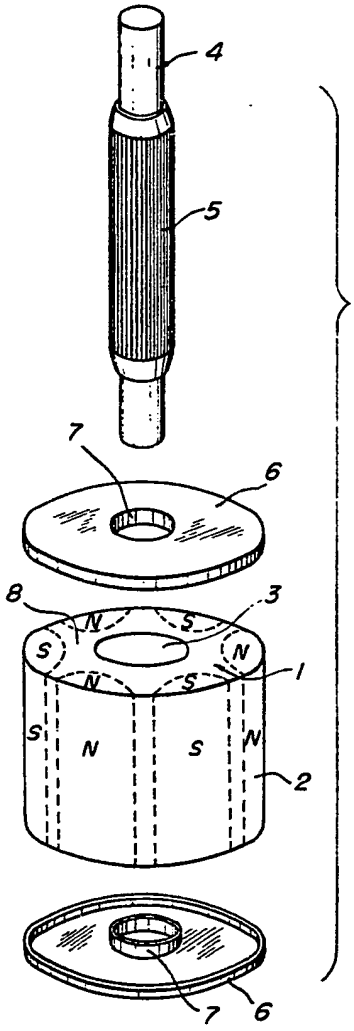

Fig. 1

Fig. 2